

## Claims

- [c1] 1.A method of spiking a mixed acid liquid in a reactor by using a computer to control a concentration of the mixed acid liquid, the concentration of the mixed acid liquid being controlled at a target level under a based-on-charge mode, a based-on-time mode, or a based-on-time-and-charge mode, the based-on-charge mode control comprising:  
providing a charge list including a plurality of lot numbers of product and a plurality of spiking amounts of a first acid liquid corresponding lot numbers of product; and  
introducing the spiking amounts of the first acid into the reactor in an order corresponding to the lot numbers of product;  
the based-on-time mode control comprising:  
providing a timing list including a plurality of timing points and a plurality of spiking amounts of a second acid liquid corresponding to the timing points; and  
introducing the spiking amounts of the second acid liquid into the reactor at the corresponding timing points;  
and the based-on-time-and-charge mode control comprising:  
providing a charge/timing list including spiking amounts and spike timing points; and  
introducing the spiking amounts of the first acid into the reactor based on the lot numbers of product and the spike timing points.
- [c2] 2.The method of claim 1, wherein when a wafer is being etched in the reactor, the acid liquid is not introduced into the reactor.
- [c3] 3.A method of spiking a mixed acid liquid in a reactor by using a computer to control a concentration of the mixed acid liquid, the concentration of the mixed acid liquid being controlled at a target level under an even-spike mode, wherein the even-spike mode control comprises:  
providing a timing list including interval settings and spiking amounts of a third acid, wherein the spiking amounts of the third acid are constant; and  
introducing the spiking amounts of the third acid into the reactor based on the interval settings.

[c4] 4.A method of spiking a mixed acid liquid in a reactor by using a computer to control a concentration of the mixed acid liquid, the concentration of the mixed acid liquid being controlled at a target level under a based-on-charge mode, wherein the based-on-charge mode control comprises:  
providing a charge list including a plurality of lot numbers of product and a plurality of spiking amounts of a first acid liquid corresponding to lot numbers of product; and  
introducing the spiking amounts of the first acid into the reactor in an order corresponding to the lot numbers of product;  
5.The method of claim 4, wherein when a wafer is being etched in the reactor, the acid liquid is not introduced into the reactor.

[c5] 6. A method of spiking a mixed acid liquid in a reactor by using a computer to control a concentration of the mixed acid liquid, the concentration of the mixed acid liquid at a target level being controlled under a based-on-time mode, wherein the based-on-time mode control comprises:  
providing a timing list including a plurality of spike timing points and a plurality of spiking amounts of a second acid liquid corresponding to the spike timing points; and  
introducing the spiking amounts of the second acid liquid into the reactor at the corresponding spike timing points.

[c6] 7.The method of claim 6, wherein during a wafer is being etched in the reactor, the acid liquid is not introduced into the reactor.

[c7] 8.A method of spiking a mixed acid liquid in a reactor by using a computer to control a concentration of the mixed acid liquid, the concentration of the mixed acid liquid being controlled at a target level under a based-on-time-and-charge mode,  
wherein the based-on-time-and-charge mode control comprises:  
providing a charge/timing list including spiking amounts and spike timing points; and  
introducing the spiking amounts of the first acid into the reactor based on lot numbers of product and the spike timing points.

[c8]

9.The method of claim 8, wherein when a wafer is being etched in the reactor, the acid liquid is not introduced into the reactor.

11. The method of claim 10, wherein the acid liquid is not introduced into the reactor during the etching process.